As a case in point, the author takes the natterjack toad. "There are three particular features about the natterjack toad," he writes, "which distinguish it from the commoner variety. It has a yellow stripe down its back, its hind feet are not webbed, and it has a peculiar running method of progression. A really good illustration of this toad would show these three distinctive features. A photograph might easily be produced which would show none of them—a side view, for instance, of the toad sitting still—and such a photograph would probably be the one taken by a photographer who had not troubled to make himself acquainted with his subject."

The author then proceeds to show the methods necessary in order to procure the desired results. Elsewhere he states that for photography of this description the only satisfactory way is to keep the animals whose portraits are desired in confinement for some little time, when they soon become sufficiently tame not to mind the approach of the artist with his camera. It will, of course, be obvious in this connection that the photographer must either be a good practical naturalist himself, or that he must consult someone duly qualified to point out the characteristic features of the animals about to be taken.

Not less important than the display of an animal's distinctive structural peculiarities is the reproduction of its characteristic attitudes. In this respect nature fortunately comes to the artist's assistance. "Living creatures," as the author truly observes, "adopt their characteristic attitudes more frequently than any others. The photographer has, therefore, to learn which attitudes his subjects most frequently adopt, and should endeavour to perpetuate them in his store of negatives."

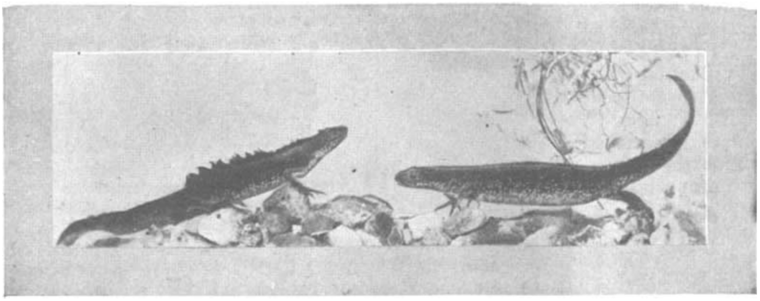

FIG. 2.—Male and Female Great Newts.

A third essential is to pay the greatest attention to the natural "accessories" of the animals photographed. In many cases this is a matter of extreme difficulty; and the artist is frequently sorely tempted to take his subject when in a favourable pose amid incongruous surroundings. Should this course have to be taken—and in some cases it is almost unavoidable—the author advises blocking out the animal and making a fresh negative with a suitable background.

Mr. English is careful to distinguish animal photography of the above nature from what he terms "stalking" photography, when the animal is approached stealthily in its native haunts with the camera, or the camera is concealed in a suitable position to await its arrival. And he renders full justice to the excellent results which have been obtained by the Messrs. Kearton in this branch of the subject.

In the main the author deals with British animals, of which he gives some exquisite pictures. Two of these, by the courtesy of the publishers, we are enabled to reproduce, so that our readers can judge for themselves as to their merits. While it is no doubt of the highest importance to have a large stock of life-like portraits of our native animals, the number of photographers who labour in this field will probably ere long produce a sufficiency. For scientific zoology the portraits of rare foreign animals are still more essential; and in a future edition it may be hoped that the author will see his way to urging his fellow-workers to take up this part of the subject in real earnest.

A large portion of the work is, of course, devoted to the *technique* of the subject; but this we may well leave to the consideration of practical photographers.

The author has done good service in endeavouring to impress on his fellow-workers the importance of producing animal portraits which shall satisfy the requirements of zoologists, and we sincerely trust that his efforts to promote improvement in these matters will not be in vain. The book should be in the hands of every photographer as well as of every naturalist. R. L.

NOTES.

THE Royal Society's medals have this year been adjudicated by the president and council as follows:—The Copley Medal to Prof. J. Willard Gibbs, For. Mem. R.S., for his contributions to mathematical physics; a Royal Medal to Prof. William Edward Ayrton, F.R.S., for his contributions to electrical science; a Royal Medal to Dr. William Thomas Blanford, F.R.S., for his work in connection with the geographical distribution of animals; the Davy Medal to Prof. George Downing Liveing, F.R.S., for his contributions to spectroscopy; and the Sylvester Medal to Prof. Henri Poincaré, For. Mem. R.S., for his many and important contributions to mathematical science. His Majesty the King has been graciously pleased to approve of the award of the Royal medals. The medals will, as usual, be presented at the anniversary meeting on St. Andrew's Day (November 30). The Society will dine together at the Whitehall Rooms on the evening of the same day.

THE following is a list of those who have been recommended by the president and council of the Royal Society for election into the council for the year 1902 at the anniversary meeting on November 30. The names of new members are printed in italics:—President, Sir William Huggins, K.C.B.; treasurer, Mr. A. B. Kempe; secretaries, Sir Michael Foster, K.C.B., and *Dr. Joseph Larmor*; foreign secretary, Dr. T. E. Thorpe, C.B.; other members of the council, Prof. H. E. Armstrong, *Mr. W. Bateson*, *Dr. W. T. Blanford*, *Prof. F. O. Bower*, Mr. C. V. Boys, *Prof. W. Burnside*, *Prof. W. W. Cheyne, C.B.*, *Prof. G. C. Foster*, Prof. W. M. Hicks, *Mr. Frank McClean*, *Prof. H. A. Miers*, *Sir John Murray, K.C.B.*, Prof. J. Emerson Reynolds, Dr. R. H. Scott, Prof. C. S. Sherrington, and Mr. J. W. Swan.

ON November 24 a medal will be presented to M. Berthelot, in the large amphitheatre of the Sorbonne, to commemorate his services to science. M. Berthelot's activity during more than fifty years has been extraordinary, and there are no branches of chemistry on which he has not made his mark. His last publication is "Les Carbures d'hydrogène," a work in three stately volumes, comprising an account of his labours on these compounds during the last half-century. To mention only some of M. Berthelot's achievements, his researches on the synthesis of the natural fats, his discovery of polyhydric alcohols, his work on explosives, on the fixation of nitrogen by plants, his long investigations in the domain of thermal chemistry, and the contributions which he has made to the history of chemistry, constitute a record of work which, it is not too much to say, has not been equalled since the time of Berzelius. The presidents of the Royal and the Chemical Societies have been asked to be present to represent English science, and the President of the Republic will do honour to this eminent man of science by presiding at the celebration.

The list of birthday honours includes the name of Prof. A. Pedler, F.R.S., Director of Public Instruction, Bengal, who has been made a Companion of the Order of the Indian Empire.

Prof. A. Fischer de Waldheim, the director of the Botanic Garden at St. Petersburg, has just commenced the publication of a periodical *Bulletin* of the Gardens.

The Imperial Academy of Sciences of Vienna has received intelligence of the botanical expedition in Brazil, from its chief, Prof. R. von Waldheim, down to September 10, from São Paulo. The rivers Rio Branco, Rio Mambu, and Rio Aguapihy, flowing through an almost unexplored country, had been navigated in canoes; and large consignments have already been sent to Vienna in the form of living plants and roots, herbarium specimens, preparations in spirit, woods, fruits, and economic products.

We have received from Major Ross the "First progress report of the campaign against mosquitoes in Sierra Leone" (Liverpool School of Tropical Medicine, *Memoir* v. part i.), in which is detailed the methods of procedure and the results up to date of this interesting attempt to reduce the numbers of mosquitoes in a district. The works carried out include the removal of rubbish, especially empty tins and broken bottles, which form breeding places for Culex and Stegomyia (the supposed yellow-fever host), and the filling up and drainage, or brushing out and treating with crude petroleum, of the puddles which harbour Anopheles. Dr. Taylor, who is in charge of the expedition, writes that it is now (September 28) difficult to find Anopheles, Stegomyia is getting very scarce, and Culex is only seen now and again. Dr. Daniels, of the London School of Tropical Medicine, gives testimony to the same effect in a report at the end. The expedition is intended to be an object-lesson in the manner of ridding tropical towns of mosquitoes by drainage and cleaning, and has been financed by private munificence.

Rope railways have for some time been in use for the conveyance of iron ore and stone in districts where, owing to the nature of the country, ordinary railways would be impracticable. One of the latest examples of these has recently been constructed in Ireland between Ballinphellic and Ballinhassig by the Cork, Bandon and South Coast Railway Company. It is intended for the conveyance of bricks from the works of the Cork Brick Manufacturing Company, situated about eight miles from Cork. The line is four miles in length and has a transporting capacity of twelve tons per hour. There are 126 buckets, which travel at the rate of four miles an hour, each holding 3½ cwt. The rope is of steel, and there are forty-three supports consisting of steel trestles, the height of which is sufficient to allow the buckets to travel overhead clear of all obstructions. The loads automatically take on and leave the cables at the stations without any separate coupling operations. The line is worked by a stationary engine, and it requires 12 h.p. to drive the rope. The cost of transport of bricks to Cork has been reduced from an average of 18*s.* per thousand to 5*s.*

In the Swedish journal *Jernkontorst*, a description is given by Mr. G. F. Heindenstam of the conversion of the wood waste and sawdust from the saw-mills in that country into charcoal. The waste pieces of wood cut off in the conversion of the logs are passed through rolling-mills designed for drying out the greater part of the moisture and reducing the wood to the form of sawdust. This is then passed on to heated presses and the carbonising apparatus. In these the liquid bye-product is distilled and the solid matter converted into briquettes. A plant consisting of light carbonising apparatus can deal with 9000 tons of waste wood and sawdust, from which 6000 tons of charcoal briquettes are made, the remainder being used as fuel for driving the machinery. These yield 2006 tons of charcoal, having a market value of from 2*l.* 5*s.* to 3*l.* 6*s.* per ton, besides 530½ tons of tar, 300 tons acetate of lime, and 45 tons of methylic alcohol and acetone. The total yield from these is 11,487*l.*, the cost of conversion being 7661*l.*, leaving a profit of 3826*l.* after allowing 2550*l.* for the value of the waste wood and sawdust, and 10 per cent. on a capital of 16,666*l.*

A paper has been contributed to the Vienna Academy of Sciences by Prof. J. M. Pernter on polarisation of light in turbid media, considered in reference to the colour of the sky. The author has observed the polariscopic effects and the relation of the polarisation to the colour in various emulsions of mastic in water, and a comparison has been made between these effects and those observed in the light of the sky. He finds that the two phenomena are in close agreement, and an experimental test is thus afforded of Lord Rayleigh's theory of the colour of the sky.

In connection with the Austrian deep-sea expedition a paper has been published by the director, Herr Th. Fuchs, dealing with the character of the deep-sea fauna of the Red Sea. In spite of the prevailing high temperatures even at the greatest depths, the fauna is entirely of the character of a deep-sea fauna and resembles that of the open ocean. The deep-sea fauna, considered both as a whole and in regard to its individual species, shows considerable resemblance with the fauna of the so-called "Badner Tegel." Lastly, the peculiar fauna begins at a depth of about 200 metres, although the temperature at this depth is about 23° C., and is sufficiently high to allow of the growth of coral reefs.

Van der Waals's equation was undoubtedly an important step in obtaining a more approximate representation by a mathematical formula of the isothermal lines of fluids than was given by Boyle's law or similar formulæ. The further modifications proposed by Clausius, Tait and others, including, recently, Amagat, all tend to show that such formulæ are at best to be treated as mere approximations. The next step in advance, consisting in the expression of the equation of state of gases by means of series, forms the subject of a paper, by Dr. H. Kamerlingh Onnes, in the *Communications* from the Leyden Physical Laboratory, No. 61. Various forms of series were tried, and the most convenient was found to be an expansion of pv in descending powers of v. For the coefficients of these powers, which are, of course, functions of the temperature, series involving the temperature and its reciprocal as well as exponential functions of the reciprocal of the temperature were chosen. A closely allied subject, namely the precise isothermal of hydrogen at 20° C. up to 60 atmospheres, is dealt with by Mr. J. C. Schalkwijk in the preceding number of the *Communications.*

The eleventh volume of the *Deutsches Meteorologisches Jahrbuch*, by Prof. Paul Bergholz, contains the meteorological observations of the town of Bremen for the past year. The volume is divided into six sections, the first two of which deal with the hourly and daily readings of the various meteorological instruments throughout the year, and the third with the results from the different rainfall stations for the same period. Part iv. contains the mean values of the readings of the self-recording instruments for the years 1896–1900 and 1891–1900, while part v. includes similar information from observations made three times a day. Of perhaps the greatest interest is the sixth and last section, in which are brought together the results of the meteorological observations since they were commenced. Thus we find that the series for temperature commenced in the year 1803, that for rainfall in 1830, and pressure and humidity in 1876. The mean values are given in a very convenient form, being arranged according to intervals of a month, year, five years and ten years. There are also numerous other tables in which maxima values, minima values, temperature for each season of the year, number of frost days, &c., are separately dealt with. The volume closes with a table showing the mean values for the whole period of observation of all the meteorological elements for each month of the year, the mean temperature for every day of the year, and a set of curves illustrating many of the variations mentioned above and showing many of the mean daily variations.

THE International Aëronautical Committee have published their complete account of the results of the manned and unmanned balloon ascents which took place on November 8, 1900. The work contains the original observations, together with those taken at mountain stations, and special cloud observations on the day of the ascents. Dr. Hergesell has discussed the observations of each ascent with reference to barometric pressure, temperature and wind, and has shown on two charts the distribution of pressure and temperature at the sea level and surface of the earth respectively and at a height of 5000 metres. Great variations of temperature were exhibited in different localities, even up to the highest strata of air; the coldest districts lay in the north-west and the warmest in the south-east of the continent. At an altitude of 5000 metres, the temperature over Paris was about – 20° C. and over Vienna, – 11°. The isotherms at 5000 metres run from S.W. to N.E.; that of – 10° extends from the north of the Adriatic to Moscow; that of – 15°, from the south-west of France, across Germany and the Baltic to St. Petersburg, and those of – 20° and – 25° take a more northerly course, while over Ireland the air is cooled to – 30°. The isobars at the above-mentioned altitude, like the isotherms, run generally from S.W. to N.E.; the pressure is lowest over the British Islands and highest over the S.E. of Europe. The wind velocity is best shown by the manned ascents; from the observations taken by Dr. Berson, the velocity rose from 8·3 metres per second at 1600 metres to 11·2 metres per second at 2300 metres, and he estimates that at altitudes above 6000 metres the velocity would be about 16 metres per second. The ascents were mostly made during anti-cyclonic conditions, and an inversion of temperature was generally observed, especially after reaching the limits to which the ground fog extended.

WE have received from Messrs. Isenthal and Co. a well-illustrated catalogue of electric heating and cooking appliances, which shows that this branch of electrical industry has been very fully worked out. It cannot be claimed for electrical heating that it is very economical, but its superior cleanliness and convenience are recommendations that are sure to lead in the course of time to its widespread use. A point strongly in its favour is that heat need only be generated at the time and the exact place at which it is required; an electrical cooking range can be shut down when not needed much more easily and completely than a coal fire. It is impossible to estimate the gain in cleanliness and healthiness which would result from a general adoption of electrical in place of coal or gas heating for domestic purposes, but the advantage is sure to be realised sooner or later, just as it is being realised in electric lighting, and we may hope in time to have a fogless London as a result. At present electric lighting companies have a business which is so rapidly expanding that it is, perhaps, not worth their while to take special pains to induce consumers to adopt electrical heating. The gain would all the same be very great to the supply companies, as it would give them a heavy day load. That there is already a considerable demand for electric heating apparatus is evidenced by the catalogue before us, which describes appliances for meeting almost every conceivable want, both for domestic and scientific or laboratory purposes. Some of the latter apparatus would be very convenient in laboratories where electric current is available, as it affords easier means of regulation and is safer than gas, and also allows any desired temperature to be obtained a second time with much less trouble.

WE have received from the publishers, Messrs. Iliffe and Sons, Ltd., the Christmas number of *Photography*, a number which will be welcomed by all interested in the art of picture making. No pains seem to have been spared to make the magazine all that could be desired in the way of quality of paper and printing, while the text is of very general interest and the reproductions of numerous well-known photographs excellent. In the opening article a brief account is given, with illustrations, of three of the foremost photographic artists in France, and we may suggest to those who are not familiar with their style of work that much may be learnt from the article. The second contribution is on a subject which interests every photographer, but the importance of which is not often thought of until too late. One recollects with regret how many good negatives would have been greatly improved if only a figure had been inserted or placed in another position or even omitted altogether. Valuable hints on this score will be found in the chapter entitled "the introduction of figures into landscape pictures," and much can be gathered from the excellent and appropriate illustrations. The main part of this publication is devoted to criticisms and reproductions of many pictures by well-known photographers, which, as is stated, is a reprint in a revised form from *Photography*. The number concludes with a set of sixteen borders with different designs for Christmas cards, all of which are copyrighted, but are placed at the disposal of amateurs and professionals desiring to use them for their own cards.

THE Imperial Department of Agriculture for the West Indies has issued a full report on sugar-cane experiments conducted at Antigua and St. Kitt's in the season 1900-1901. The report is in two parts, the first, of 32 foolscap pages, dealing with experiments with varieties of sugar cane, with an appendix on the chemical selection of sugar cane; and the second, of 78 pages, with manurial experiments. Mr. Francis Watts, chemist-in-charge, states that the variety and manurial experiments involved the analysis of the juice from upwards of 900 plots, while those on chemical selection necessitated the determination of the sucrose in 600 canes. Taking the mean results of the experiments in Antigua, cane D 95 occupies the best place with 8158 lb. of sucrose per acre in juice, Mont Blanc variety following with 7256 lb., while B 147, the best Barbados seedling, stands twelfth on the list with 6050 lb. The means for ratoon canes, however, place B 147 first with 7164 lb. In St. Kitt's, one of the most promising of the Barbados canes, B 208, stands first with 9817 lb., Naga B second with 8956 lb. and B 147 third with 8874, Mont Blanc and D 95 being respectively eleventh and twelfth on the list. On the question of chemical selection the results obtained were not conclusive. Polarising the juice of 200 "high" canes and 200 "low" canes, the difference proved so small that it may lie entirely within the limits of experimental error. The manurial experiments are fully described, with forty-three tables of particulars. They indicate the possibility of growing good crops of plant canes with the use of pen manure only (including such organic manures as green dressing), and when it is obtainable in sufficient quantity artificial manure is unnecessary. If there is no pen manure, fields in good condition will produce good crops with the aid of artificial manures. What should be done with phosphate is not clear. Artificial manures are unremunerative on land in poor mechanical condition. It is recommended that energy should be devoted to raising pen manure rather than spend money on artificial manures. Experiments are being undertaken to determine whether it will be remunerative to use artificial manures in growing green dressings.

GEOLOGICAL surveys in the United States take a more comprehensive view of geology than is prevalent elsewhere, as they deal generally with natural history. The State Geologist of Alabama has issued a bulky volume on the plant life of the State, by Dr. Charles Mohr. In it are enumerated all the known species of native plants, with their synonymy, localities and mode of occurrence. The author makes some remarks on the spontaneous flora in its relation to agriculture, and observes that the fitness of the land for the production of a special crop can often be ascertained by the farmer from the character of the vegetation alone, without having to resort to costly and time-consuming experimentation.

THE Geological Survey of India has published an account of the Son Valley in the Rewah State and of parts of the adjoining districts of Jabalpur and Mirzapur, by Messrs. R. D. Oldham, P. N. Datta and E. Vredenburg (*Mem. Geol. Surv. India*, vol. xxxi. part i., 1901). The report is accompanied by a colour-printed map on the scale of an inch to four miles, and this shows the exposed areas of unfossiliferous and more or less metamorphosed rocks, a red shale series, and overlying divisions of the Vindhyan and Gondwana groups, which have been regarded as representing Silurian and Jura-Trias respectively. The present work relates almost wholly to the stratigraphical, petrographical and physical questions. There is an almost complete absence of minerals of economic value and apparently also of fossils. Special attention is drawn to the porcellanites of the Lower Vindhyan series, which are regarded as volcanic tuffs.

DR. FRITZ NOETLING describes the fauna of the Miocene beds of Burma ("Palæontologia Indica," new series, vol. i. 1901). Two groups of Tertiary strata are recognised; the lower, characterised by a marine fauna, is considered to be of Miocene age, and the upper, characterised by fluviatile and terrestrial forms of life, is regarded as Pliocene. The Miocene deposits yield remains of Anoplotherium, Crocodilus, Python and Myliobates, which suggest comparison with higher Eocene and Oligocene strata. The author, however, maintains that the beds are newer than the Bartonian (Eocene), and he has "purposely refrained from mentioning the Oligocene," as, in his opinion, "no evidence warrants the adoption of this name for any part of the Indian Tertiary system." The fauna is composed mainly of Lamellibranchs and Gasteropods, and these exhibit relationships with the Eocene of France and with the recent fauna of the western Pacific. Thirty per cent. of the species are direct ancestors of forms living in the Indian Ocean, but this recent fauna contains also a foreign, probably European, element of Miocene origin. One of the author's conclusions is that there was no direct communication between the Miocene Ocean of Europe and India during the Miocene period, as there is not a single species common to the two areas. The vertical range of the species is very restricted.

THE Report of Mr. Edgar Thurston, superintendent of the Goverment Museum, Madras, for the year 1900–1901 has reached us, and contains much interesting information concerning the work done in the various departments of the institution, particularly in the case of those devoted to anthropology, natural history and industrial economics. During the year under review four parts of the *Bulletin* of the Museum were issued, the contents of which have already been referred to in these columns.

THE Baschkirs are an interesting group of people who live on the eastern slopes of the Urals; formerly they were all nomads, but they have been constrained by the Russian Government to become more or less settled, and they now constitute three groups—the forest- mountain- and steppe-Baschkirs. Hofrat Peter von Stenin gives in *Globus* (Bd. lxxx., Nr. 10, p. 150) an ethnographical illustrated sketch of these people, with references to the literature of the subject, but he omits the brilliant essay on their sociology by M. Edmond Demolins in *La Science Sociale* (tome ii., 1886, p. 405), which is based upon the observations of Le Play in the second volume of his "Ouvriers Européens." The difficulty with which a pastoral people take to agriculture is indicated by both the German and French authors in a manner characteristic of their several nationalities.

THE anthropological investigations in connection with the Madras Government Museum are being conducted with energy and ability, the last research being by Superintendent F. Fawcett on the ethnography of the Nâyars of Malabar. The account is published in the *Bulletin* of the Museum (vol. iii. No. 3) and is illustrated with eleven plates. The Nâyars, the Nareæ of Pliny, were the swordsmen, the military caste of the west coast of India. They are said to be the most complete existing example of inheritance through females. Their average stature is 1·656 m., the cephalic index 73·1, and nasal index 76·8; that is, they belong to the somewhat short, long-headed, distinctly dolichocephalic mesorhine group of the non-Aryans of southern India. The customs relative to marriage, birth, death are carefully narrated. The religion is described, special mention being made of serpent worship and certain festivals, and astrology and magic.

MR. C. J. HERRICK, the well-known author of the "Mammals of Minnesota," contributes to the October number of the *Journal of Comparative Neurology* an important paper on the cranial nerves and cutaneous sense-organs of the North American cat-fishes, or siluroids. Starting with Merkel's discovery of the divisibility of the cutaneous sense-organs into two chief types—the "terminal buds" and "neuromasts," or organs of the lateral-line system—the author has endeavoured to ascertain whether these two types are supplied by different nerves, as has been thought probable by other investigators. The investigation has involved the complete working-out of the nervous system of the common American cat-fish, *Ameiurus catus*.

THE latest issue (vol. xxix. part iii.) of Gegenbaur's *Morphologisches Jahrbuch* contains five papers, all dealing with the morphology and development of the lower vertebrates. Prof. B. Haller discusses the primitive kidneys of the spiny dog-fish, Mr. H. L. Bruner the respiratory mechanism of amphibians, as exemplified by the myology of two genera, and Mr. J. F. Holm the finer anatomy of the nervous system of the lampreys of the genus Myxine. The first appearance of the olfactory organ in the larva of the true lampreys forms the subject of an article by Dr. W. Lubosch, while F. Hochstetter describes certain variations in the aortic arch and the bases of the arteries springing from the same in reptiles.

THE August issue (vol. iv. part i.) of *Annotationes Zoologicae Japonenses* contains five papers, for the most part on somewhat abstruse biological subjects, and thus bears witness to the thoroughness with which natural science is studied in Japan. In the first communication Prof. Mitsukuri discusses "negative phototaxis" in the Japanese periwinkles and its influence on their habitat. Knowing that these molluscs like shallow water, it is argued that when the depth becomes too great for their comfort they endeavour to escape by crawling in the direction which appears to them the darkest—that is towards the land. In a second paper Mr. S. Hatta reviews the lampreys of Japan;

while in a third Dr. Bashford Dean adduces evidence to prove the existence of vestiges of an original holoblastic cleavage in the egg of the Japanese representative of the Port Jackson shark. This discovery is of the highest morphological importance, sharks' eggs having been hitherto regarded as typically meroblastic. "No one, I fancy," writes the author, "would have been bold enough to have prophesied that the wide difference between the typically meroblastic egg of the shark and the holoblastic egg of such a teleostome as a sturgeon might come to be bridged over within the limits, not of fossil sharks, but of recent sharks themselves."

THE singular bulbiform seeds of certain Amaryllideæ—especially species of Amaryllis and Crinum—are the subject of an interesting paper by Dr. A. B. Rendle in the November number of the *Journal of Botany*. These seeds are of three kinds:—(1) True seeds developed from a normal ovule, the outer integument of which becomes thick and fleshy after fertilisation, and forms the substance of the bulbiform mass; (2) true seeds developed from a naked ovule, the fleshy substance being derived entirely from the endosperm, which develops chlorophyll in its outer layers and continues to grow for some time; (3) a vegetative growth replacing the seed; a normal ovule is produced, but a viviparous growth of an adventitious shoot and root takes place at the base, and a bulbil is formed, the ovule integuments forming the outer coats.

DR. FRIEDRICH BERWERTH has communicated to the Vienna Academy of Sciences a paper on soundings from the eastern Mediterranean. In regard to the distribution of calcareous mud, it is found that two principal zones exist, one to the north of the Nile delta, which extends along the Syrian coast and contains but little carbonate of lime (5 to 15 per cent.), while the other, consisting of the remainder of the eastern Mediterranean, is largely calcareous, the proportion of chalky matter being on an average 60 per cent., with variations of 20 per cent. above and below this average. The relation between the proportion of calcareous matter and the depth appears to be at variance with what would be expected from Murray's theory. The sedimentary matter consists, in general, of (1) calcareous organic remains (mollusca and foraminifera), (2) fragments of siliceous matter of organic origin, including sponges and radiolaria, (3) fragments of minerals and rocks, (4) a precipitate, partly calcareous, partly argillaceous, showing little microscopic structure, which constitutes the main part of the mud.

A SOUND and practical knowledge of "The Cyanide Process of Gold Extraction" can be obtained from the volume on that subject by Prof. James Park, published by Messrs. Charles Griffin and Co. The first English edition was favourably noticed in these columns last year (vol. lxii. p. 148), and the second has now appeared. The whole volume has undergone revision, and the new matter includes a detailed description of well-designed slime and sulphide plants now in use in the great mining centres of the world.—Another of Messrs. Griffin's technical handbooks which has reached a second edition is "Practical Coal Mining," by Mr. George L. Kerr, the first edition of which was reviewed in NATURE of February 28 (vol. lxiii. p. 417).

LOW-TEMPERATURE research at the Royal Institution during the past seven years has been assisted by the Hodgkins Trust Fund—a sum of 100,000 dollars left by the late Mr. T. G. Hodgkins as a source of income to be employed in the "investigation of the relations and co-relations existing between man and his Creator." To show what has been done towards this end, Miss Agnes M. Clerke has prepared for the Hodgkins Fund a popular essay on Prof. Dewar's work at the Institution from 1893 to 1900. The essay traces the course of his researches in the physics and chemistry of low temperature, and contains, in addition, three illustrations showing the lecture table of the Royal Institution upon the occasion of the centenary commemoration lecture on liquid hydrogen, and the elaborate refrigerating-machinery and liquid hydrogen apparatus used by Prof. Dewar.

THE current number of the *Berichte* contains a paper, by A. Hantzsch and A. Holl, on sulphimide. This substance was first obtained by W. Traube from the products of the action of ammonia upon sulphuryl chloride, and the formula SO_2NH was attributed to it, from the analyses of its salts. In the present paper the authors have been successful in obtaining sulphimide in the solid form, and have found by molecular weight determinations that it resembles cyanuric acid in being trimolecular $(SO_2NH)_3$. They have also succeeded in isolating the methyl ester of this substance, and have found that this is also trimolecular. It is pointed out that the analogy between the nitrogen derivatives of carbonic acid and sulphuric acid is much closer than has hitherto been supposed.

Bulletin No. 186 of the U.S. Geological Survey contains an interesting study of pyrites and marcasite, by Dr. H. N. Stokes, and describes a method for the quantitative determination of these minerals when in mixture. The method depends upon the fact that when either mineral is boiled with an excess of a solution of ferric salt to complete reduction of the latter the ratio of sulphur oxidised to mineral decomposed is perfectly definite and characteristic of each mineral, provided certain standard and easily controllable conditions are observed. Under these conditions the percentage of sulphur oxidised on pyrites is about 60·4 per cent. and on marcasite about 18 per cent. of the total sulphur. The application of this method has thrown considerable light on several doubtful questions relating to the dimorphous FeS_2. It is shown, for example, that density is not a trustworthy means of determining one mineral in presence of the other, that the hypothesis that most natural specimens are mixtures of the two is without foundation, and that there is no evidence of a difference of valency of iron in the two minerals. Specimens crystallising in the regular system are true pyrites, whilst those forming rhombic crystals are true marcasite.

THE additions to the Zoological Society's Gardens during the past week include a White-crowned Mangabey (*Cercocebus aethiops*) from West Africa, presented by Mr. Fred Gordon; a Cape Zorilla (*Ictonyx zorilla*), a Derbian Zonure (*Zonurus giganteus*) from South Africa, presented by Mr. W. L. Sclater; a Gazelle (*Gazella dorcas*) from Egypt, presented by Mrs. Bensusan; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. John Booth; a Bauer's Parrakeet (*Platycercus zonarius*) from South Australia, presented by Miss Gillam; a Lobed Chameleon (*Chamaeleon parvilobus*) from South Africa, presented by the Rev. Duncan Travers; a Chacma Baboon (*Cynocephalus porcarius*) from South Africa, an Alligator Terrapin (*Chelydra serpentina*), a Pennsylvanian Mud Terrapin (*Cinosternum pennsylvanicum*), a Muhlenberg's Terrapin (*Clemmys muhlenbergi*), six Long-eared Sun Fish (*Leptomis auritus*) from North America, deposited; three Australian Wild Ducks (*Anas superciliosa*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE LEONID METEORS.—Arrangements are being made at several observatories to record, by eye observations and photography, any Leonid meteors which appear during the epoch of the Leonid meteoric shower, November 14–15.

NEBULOSITY SURROUNDING NOVA PERSEI.—A telegram from the Centralstelle at Kiel announces that from the examination of photographs taken with the Crossley reflector of the Lick